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**THE EFFECTIVE HYDROTHERAPY SYSTEM FOR WEIGHT REDUCTION  
AND QUALITY OF LIFE IMPROVEMENT AMONGST OBESE  
MALAYSIAN**



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Othman Yeop Abdullah Graduate School of Business  
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(D.Mgt)**

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## ABSTRACT

Malaysia has the highest rate of obese people within the Southeast Asia region and placed sixth in the Asia Pacific. Obesity not only impacts the person's mobility and health but also linked to absenteeism and medical leaves affecting the overall workforce productivity and efficiency. Physical activity is one of the methods in addressing obesity, and water-based activity (hydrotherapy) is recognised as an extension of the traditional land-based physical activity. This research experiments two types of hydrotherapy system, active or passive which are available in hospital settings, public places, treatment centres or even in individual homes. Subjects of both sexes and diverse age ranges were requested to immerse themselves in thermal water either exercising in large water pool within hospital setting or enjoy the high energy turbulent water movement in bath tub. The findings of the hydrotherapy sessions have shown encouraging results. Quantitative data was analysed with the help of descriptive statistics and paired sample t-test significant of pre and post hydrotherapy experiments. Qualitative data was analysed with the use of thematic analysis and specialised qualitative assessment software. This research reveals that hydrotherapy has improved subject's mobility, flexibility, exercise capability, weight reduction and their quality of life. A well-managed hydrotherapy system within the Business Process Management (BPM) context can provide positive overall results. The major limitation of this research is to gain consent to conduct the experiment in the government hospitals, where the public seek medical treatment including obesity. Whilst the current research has given some insights on the effects of hydrotherapy on obesity treatment, future research could identify and assess hydrotherapy effectiveness in other obesity linked sedentary lifestyle diseases.

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**Keywords:** active hydrotherapy, passive hydrotherapy, obesity, quality of life, weight reduction

## ABSTRAK

Malaysia merupakan antara negara yang mempunyai kadar populasi obesiti paling tinggi di rantau Asia Tenggara dan menduduki tangga keenam di Asia Pasifik. Obesiti bukan sahaja memberikan impak kepada mobiliti dan tahap kesihatan, tetapi juga berhubung kait dengan ketidakhadiran dan cuti sakit yang memberi kesan kepada keseluruhan produktiviti dan keberkesanan tenaga kerja. Aktiviti fizikal merupakan antara cara yang digunakan untuk menangani obesiti, dan aktiviti berasaskan air (hidroterapi) dikenal pasti sebagai cabang kepada aktiviti fizikal tradisional atas darat. Kajian ini menyelidik dua jenis sistem hidroterapi iaitu hidroterapi aktif dan hidroterapi pasif yang terdapat di hospital, tempat-tempat awam, pusat rawatan mahu pun di rumah. Peserta eksperimen yang terdiri daripada lelaki dan wanita dengan umur yang berbeza dikehendaki berendam dalam air panas sama ada bersenam di dalam kolam air yang besar di hospital atau bersantai di dalam tab mandi yang pergerakan airnya kuat bergelora. Hasil penemuan sesi hidroterapi ini menunjukkan keputusan yang memberangsangkan. Data kuantitatif dianalisa dengan bantuan statistik deskriptif dan sampel berpasangan 't-test' diambil sebelum dan selepas sesi eksperimen hidroterapi. Data kualitatif dianalisa dengan bantuan analisis tematik dan perisian khusus untuk penilaian kualitatif. Kajian ini menunjukkan bahawa hidroterapi berjaya meningkatkan tahap mobiliti, fleksibiliti, kebolehan bersenam peserta, penurunan berat badan dan peningkatan kualiti hidup. Sistem hidroterapi yang diurus tabdir dengan sempurna dalam lingkungan Pengurusan Proses Perniagaan (BPM) boleh mendatangkan kesan positif secara keseluruhannya. Kekangan utama dalam kajian ini adalah mendapatkan kebenaran pihak hospital kerajaan bagi tujuan eksperimen memandangkan hospital merupakan akses utama bagi rawatan perubatan termasuklah rawatan obesiti. Kajian ini memberikan sedikit pemahaman tentang kesan hidroterapi pada rawatan obesiti. Untuk kajian akan datang, para penyelidik boleh mengenal pasti keberkesanan hidroterapi untuk merawat penyakit-penyakit berkaitan obesiti yang disebabkan oleh gaya hidup.

**Kata kunci:** hidroterapi aktif, hidroterapi pasif, obesiti, kualiti kehidupan, pengurangan berat badan

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## TABLE OF CONTENT

PERMISSION TO USE.....	iv
ABSTRACT.....	v
ABSTRAK .....	vi
ACKNOWLEDGEMENT.....	vii
TABLE OF CONTENT.....	viii
LIST OF TABLE .....	xiv
LIST OF FIGURE .....	xvi
ABBREVIATION .....	xviii
CHAPTER ONE: INTRODUCTION .....	1
1.1 Background of the Study .....	1
1.2 Problem Statement .....	6
1.3 Research Questions .....	7
1.4 Research Objectives .....	8
1.5 Significance of the Study.....	8
1.6 Scope and Limitations of the Study .....	9
1.7 Operational Definitions of Keywords .....	12
1.7.1 Obesity.....	12
1.7.2 Hydrotherapy.....	12
1.7.3 Active Hydrotherapy.....	12
1.7.4 Passive Hydrotherapy .....	13
1.7.5 Quality of Life.....	14
1.8 Organisation of the Thesis .....	15
CHAPTER TWO: LITERATURE REVIEW .....	16

<b>2.1 Business Process Management .....</b>	<b>16</b>
<b>2.2 Process Management.....</b>	<b>18</b>
<b>2.3 Service Process Management .....</b>	<b>20</b>
<b>2.3.1 Human Resource .....</b>	<b>20</b>
<b>2.3.2 Service Culture .....</b>	<b>21</b>
<b>2.3.3 Service Environment .....</b>	<b>22</b>
<b>2.4 Operation Management .....</b>	<b>22</b>
<b>2.5 Continual Improvement.....</b>	<b>24</b>
<b>2.6 Business Process Management and Healthcare Sector .....</b>	<b>26</b>
<b>2.6.1 Business Process Re-engineering.....</b>	<b>27</b>
<b>2.6.2 Key Feature of BPR.....</b>	<b>28</b>
<b>2.7 System Framework.....</b>	<b>29</b>
<b>2.7.1 System Theory .....</b>	<b>30</b>
<b>2.7.2 Hard and Soft System .....</b>	<b>31</b>
<b>2.8 Obesity .....</b>	<b>32</b>
<b>2.8.1 Definition of Obesity.....</b>	<b>32</b>
<b>2.8.2 Body Mass Index (BMI).....</b>	<b>33</b>
<b>2.8.3 Waist Circumference (WC).....</b>	<b>34</b>
<b>2.8.4 Waist Hip Ratio (WHR).....</b>	<b>34</b>
<b>2.9 Non-communicable Diseases (NCDs).....</b>	<b>35</b>
<b>2.10 Prevalence of Obesity .....</b>	<b>36</b>
<b>2.11 Health and Consequences of Obesity.....</b>	<b>39</b>
<b>2.12 Effects of Obesity .....</b>	<b>41</b>
<b>2.12.1 Morbidity.....</b>	<b>41</b>
<b>2.12.2 Mortality.....</b>	<b>42</b>



2.12.3 Economic Impact .....	43
2.12.4 Productivity .....	44
2.13 Overall Approach for Obesity Treatment.....	46
2.13.1 Diet / Calorie intake.....	46
2.13.2 Behavioural Change .....	47
2.13.3 Pharmacotherapy and Surgery .....	47
2.13.4 Physical Activity .....	49
2.13.4.1 Physical Activity for Obese .....	51
2.13.4.2 Barriers to Physical Activity .....	51
2.14 Hydrotherapy.....	53
2.14.1 Types of Hydrotherapy .....	57
2.14.2 Active Hydrotherapy.....	58
2.14.2.1 Aquatic Exercise .....	58
2.14.2.2 The Bad Ragaz Ring Method.....	60
2.14.2.3 Hammam.....	60
2.14.3 Passive Hydrotherapy .....	61
2.14.3.1 Balneotherapy .....	62
2.14.3.2 Spa Therapy .....	62
2.15 Hydrotherapy Procedure.....	63
2.16 Hydrotherapy Effectiveness .....	68
2.16.1 Hydrotherapy for Medical Conditions .....	72
2.16.2 Hydrotherapy as a Form of Physical Activity .....	73
2.16.3 Hydrotherapy as Obesity Intervention.....	74
2.16.4 Hydrotherapy for Quality of Life .....	76
2.17 Critical Review of Current Literature .....	77

2.18 Research Framework .....	79
2.19 Summary .....	80
<b>CHAPTER THREE: METHODOLOGY.....</b>	<b>84</b>
3.1 Introduction .....	84
3.2 Research Design.....	85
3.3 Operational Definition .....	87
3.3.1 Body Mass Index.....	87
3.3.2 Waist Hip Ratio .....	88
3.3.3 Waist Circumference.....	88
3.3.4 Blood Pressure .....	89
3.3.5 Six (6) Minutes' Walk Test .....	90
3.3.6 Shuttle Walk Test .....	90
3.3.7 Skinfold Calliper Test .....	91
3.4 Research Approach .....	92
3.4.1 Data Gathering .....	92
3.4.2 Pilot Study .....	93
3.4.3 Population and Samples.....	94
3.4.4 Small Sample Size in Clinical Experiment.....	95
3.4.5 Randomization .....	97
3.5 Research Instrument .....	98
3.5.1 Baseline Review .....	100
3.5.2 Health Survey Questionnaire .....	101
3.5.3 Interview.....	108
3.6 Data Collection.....	109
3.7 Data Analysis .....	109

3.8	Reliability and Validity .....	111
3.9	Mixed Research Method .....	112
3.10	Triangulation Approach .....	115
3.11	Active Hydrotherapy Procedure .....	117
3.12	Passive Hydrotherapy Procedure .....	122
<b>CHAPTER FOUR: RESULTS AND DISCUSSION .....</b>		<b>124</b>
4.1	Introduction .....	124
4.2	Quantitative Data Analysis and Results .....	125
4.2.1	AHT Clinical Experiment.....	126
4.2.1.1	Subject 1.....	126
4.2.1.2	Subject 2.....	129
4.2.1.3	Subject 3.....	131
4.2.2	PHT Pilot Study.....	136
4.2.3	PHT Clinical Experiment .....	137
4.3	Paired Sample T-Test Results .....	152
4.4	Reliability and Validity .....	154
4.5	Qualitative Data Analysis and Results .....	154
4.6	Summary Analysis Findings.....	158
4.7	Conclusion .....	160
<b>CHAPTER FIVE: CONCLUSION AND RECOMMENDATION.....</b>		<b>161</b>
5.1	Introduction .....	161
5.2	Summary of Key Findings .....	162
5.2.1	Active Hydrotherapy.....	163
5.2.2	Passive Hydrotherapy .....	165
5.2.3	Control Group .....	166

5.2.4 Hydrotherapy Effectiveness .....	167
5.3 Conclusion .....	169
5.4 Research Contribution .....	176
5.4.1 Theoretical Contribution .....	176
5.4.2 Practical Contribution .....	178
5.4.3 Methodology Contribution .....	180
5.4.4 Managerial Contribution .....	180
5.5 BPM in Hydrotherapy Management .....	181
5.6 Research Significance .....	185
5.7 Recommendation .....	187
5.8 Limitation of Study .....	193
5.9 Future Research .....	195
REFERENCES .....	197
Appendix 1: Drug Used in the Obesity Treatment and Weight Loss .....	227
Appendix 2: Medical treatment for Obesity .....	229
Appendix 3: Active Hydrotherapy Session Form .....	231
Appendix 4: Passive Hydrotherapy Session Form .....	232
Appendix 5: SF-36V2 Health Survey Questionnaire .....	233
Appendix 6: Interview Protocol .....	238

## LIST OF TABLE

Table 2.1 Classification of Obesity.....	33
Table 2.2 Waist Circumference .....	34
Table 2.3 Waist Hip Ratio .....	35
Table 2.4 Prevalence of Obesity in Different Ethnic Groups and Gender.....	39
Table 2.5 Health Risks Associated with Obesity.....	42
Table 3.1 Protocol for the 10m Shuttle Walking Test .....	91
Table 3.2 Selected Hospital with Hydrotherapy Facilities .....	93
Table 4.1 Subject 1 Demographic Data.. .....	127
Table 4.2 Subject 1 SF-36v2 Domain Score.....	128
Table 4.3 Subject 2 Demographic Data .....	130
Table 4.4 Subject 2 SF-36v2 Domain Score.....	131
Table 4.5 Subject 3 Demographic Data .....	132
Table 4.6 Subject CG1 Demographic Data.....	133
Table 4.7 Subject CG1 Parameter Summary .....	133
Table 4.8 Subject CG1 SF-36v2 Domain Score .....	134
Table 4.9 Subject CG2 Demographic Data.....	135
Table 4.10 Subject CG2 SF-36v2 Domain Score .....	135
Table 4.11 PHT Pilot Study Result.....	137
Table 4.12 Subject A Demographic Data .....	139
Table 4.13 Subject A Parameter Summary.....	140
Table 4.14 Subject A SF-36v2 Domain Score.....	140
Table 4.15 Subject B Demographic Data.....	142
Table 4.16 Subject B Parameter Summary .....	143

Table 4.17 Subject B SF-36v2 Domain Score .....	144
Table 4.18 Subject C Parameter Summary .....	145
Table 4.19 Subject C Demographic Data.....	146
Table 4.20 Subject C SF-36v2 Domain Score .....	147
Table 4.21 Subject CG3 Demographic Data.....	149
Table 4.22 Subject CG3 Parameter Summary .....	149
Table 4.23 Subject CG3 SF-36v2 Domain Score .....	150
Table 4.24 Subject CG4 Demographic Data.....	150
Table 4.25 Subject CG4 SF-36v2 Domain Score .....	151
Table 4.26 Paired Sample T-test Results (a to f) .....	153
Table 4.27 Reliability Statistics .....	154
Table 4.28 Thematic Analysis Pre Hydrotherapy .....	155
Table 4.29 Thematic Analysis Post Hydrotherapy .....	156
Table 5.1 Comparison of Active and Passive Hydrotherapy .....	175
Table 5.2 BPM Elements Suggestions for Hydrotherapy Management .....	185

## LIST OF FIGURE

Figure 1.1 Typical Active Hydrotherapy Pool.....	13
Figure 1.2 Typical Active Hydrotherapy Session.....	13
Figure 1.3 Typical Passive Hydrotherapy Set-Up .....	14
Figure 1.4 Typical Passive Hydrotherapy Session.....	14
Figure 2.1 Reengineering Process.....	29
Figure 2.2 Adult Overweight Prevalence in Asian Country .....	39
Figure 2.3 Association between Obesity and Probability of Any Absenteeism .....	45
Figure 2.4 Recommended Obesity Treatment Options.....	46
Figure 2.5 Dynamic Systems Model of Hydrotherapy Pool and Aquatic Exercise...	64
Figure 2.6 Conceptual Research Framework.....	80
Figure 3.1 Research Process Flowchart .....	86
Figure 3.2 Data Analysis Technique.....	87
Figure 3.3 Waist Hip Ratio Measurement Part.....	88
Figure 3.4 Waist Circumference Measurement Guideline-Self Measurement .....	89
Figure 3.5 Experimental Design .....	98
Figure 3.6 Concurrent Triangulation Design .....	115
Figure 3.7 Upper Limb Movements.....	120
Figure 3.8 Lower Limb Movements .....	121
Figure 3.9 Passive Hydrotherapy Experiment Process Flow .....	123
Figure 4.1 Subject 1 SF-36v2 Component Summary Score .....	129
Figure 4.2 Subject 2 SF-36v2 Component Summary Score .....	131
Figure 4.3 Subject CG1 SF-36v2 Component Summary Score .....	134
Figure 4.4 Subject CG2 SF-36v2 Component Summary Score .....	136

Figure 4.5 Subject A SF-36v2 Component Summary Score .....	141
Figure 4.6 Subject B Component Summary Score .....	144
Figure 4.7 Subject C SF-36v2 Component Summary Score .....	148
Figure 4.8 Subject CG3 SF-36v2 Component Summary Score .....	150
Figure 4.9 Subject CG4 SF-36v2 Component Summary Score .....	152
Figure 4.10 Query Search– Pre Experiment .....	156
Figure 4.11 Query Search- Post Experiment (i).....	157
Figure 4.12 Query Search- Post Experiment (ii).....	157
Figure 4.13 Triangulation Data Summary on Weight Reduction .....	159
Figure 4.14 Triangulation Data Summary on Quality of Life .....	160



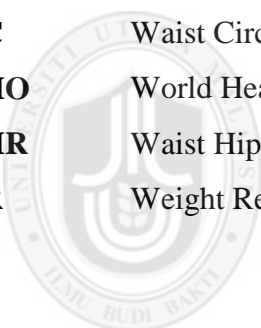


## ABBREVIATION

<b>6MWT</b>	6 Minutes' Walk Test
<b>AHT</b>	Active Hydrotherapy
<b>AQE</b>	Aquatic Exercise
<b>ASCM</b>	American College Of Sports Medicine
<b>BMI</b>	Body Mass Index
<b>BP</b>	Blood Pressure
<b>BP</b>	Bodily Pain
<b>BPI</b>	Business Process Improvement
<b>BPM</b>	Business Process Management
<b>BPMS</b>	Business Process Management Systems
<b>BPR</b>	Business Process Re-engineering
<b>BRRM</b>	Bad Ragaz Ring Method
<b>BT</b>	Balneotherapy
<b>CHF</b>	Chronic Heart Failure
<b>CI</b>	Confidence Intervals
<b>CLBP</b>	Chronic Lower Back Pain
<b>COPD</b>	Chronic Obstructive Pulmonary Disease
<b>CPG</b>	Clinical Practice Guidelines
<b>CSF</b>	Critical Success Factor
<b>CPG</b>	Clinical Practical Guideline
<b>DBP</b>	Diastolic Blood Pressure
<b>DIY</b>	Do-It-Yourself
<b>GDD</b>	Global Development Delay
<b>GDP</b>	Gross Domestic Product
<b>GH</b>	General Health
<b>H</b>	Height
<b>HC</b>	Hip Circumference
<b>HIE</b>	Health Insurance Experiment
<b>HR</b>	Heart Rate
<b>HRC</b>	Hospital Rehabilitasi Cheras
<b>HUKM</b>	National University Hospital Malaysia

<b>IARC</b>	International Agency for Research on Cancer
<b>IQOLA</b>	International of Life Assessment
<b>LDL</b>	Low-Density Lipoprotein
<b>MASO</b>	Malaysia Association Study of Obesity
<b>MCS</b>	Mental Component Summary
<b>MH</b>	Mental Health
<b>MHIQ</b>	McMaster Health Index Questionnaire
<b>MHU</b>	Mobile Health Unit
<b>MI</b>	Myocardial Infarction
<b>MOH</b>	Ministry of Health
<b>MONICA</b>	Multinational Monitoring of Trends And Determinants In Cardiovascular Disease
<b>MOS</b>	Medical Outcome Study
<b>MR</b>	Metabolic Rate
<b>NCD</b>	Non Communicable Disease
<b>NGO</b>	Non-Governmental Organisation
<b>NHMS</b>	National Health Morbidity Survey
<b>NHP</b>	Nottingham Health Profile
<b>NMRR</b>	National Medical Research Register
<b>OM</b>	Operation Management
<b>OP</b>	Operation Management
<b>PCS</b>	Physical Component Summary
<b>PF</b>	Physical Functioning
<b>PHT</b>	Passive Hydrotherapy
<b>PNF</b>	Proprioceptive Neuromuscular Facilitation
<b>QoL</b>	Quality of Life
<b>RE</b>	Role Emotions
<b>RP</b>	Role Physical
<b>RTC</b>	Regional Transformation Centre
<b>SBP</b>	Systolic Blood Pressure
<b>SCM</b>	Supply Chain Management
<b>SF</b>	Social Functioning
<b>SF-36V2</b>	Short Form-36 version 2 (Health Survey Questionnaire)

<b>SIP</b>	Sickness Impact Profile
<b>SPSS</b>	Statistical Package for Social Science
<b>STEPS</b>	STEPwise Approach to Surveillance
<b>SWT</b>	Shuttle walk test
<b>TQM</b>	Total Quality Management
<b>Tre</b>	Rectal Temperature
<b>UK</b>	United Kingdom
<b>US</b>	United States
<b>USA</b>	United States of America
<b>UTC</b>	Urban Transformation Centre
<b>UUM</b>	Universiti Utara Malaysia
<b>VO<sub>2</sub></b>	Maximal oxygen consumption
<b>VT</b>	Vitality
<b>W</b>	Weight
<b>WC</b>	Waist Circumference
<b>WHO</b>	World Health Organization
<b>WHR</b>	Waist Hip Ratio
<b>WR</b>	Weight Reduction



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## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

In today's tough competitive business environment resulted from rapid variance in technology and globalization, organizations are facing continuous pressure to improve their business process efficiency and effectiveness. Many organisations fail in their attempt to adopt business process management (BPM) (Buh, Kovačič, & Indihar Štemberger, 2015). The real challenge in bringing change is trade-off issue (Caron & Vanthienen, 2015). In this economic and business climate, BPM is one of the most important topics in many organizations. If adopted successfully, it can add significant value and efficiency to the business processes and improve business performance, productivity and give competitive advantage to organization (Buh, Kovačič, & Indihar Štemberger, 2015; Indihar Štemberger, Bosilj-Vukšić, & Jaklič, 2009; Škrinjar, Bosilj-Vukšić, & Indihar Štemberger, 2008; Bai & Sarkis, 2013; Ortbach, Plattfaut, Pöppelbu, & Niehaves, 2011; Hung, 2006). Effective design and execution of BPM is far more important for modern business organizations (Aldin & de Cesare, 2011). BPM has been an effective concept for decades, its strategic role in operation is still important to be investigated with the perspective of Information Technology and Operation Management (Liu, Li & Zhao, 2009; Bititci U, Ackermann, F., Ates, A., Davies, John D., Gibb, Stephen, MacBryde, J., 2011).

Managing operations have evolved substantially over time in response to changing priorities and paradigms (Gunasekaran and Ngai, 2012). The healthcare industry represents an important sector within services. However, little is known about the current state of research into healthcare Operation Management (OM) and Supply

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